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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XG947

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Auke Bay Ferry Terminal Modifications and Improvements Project in Juneau, Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; Issuance of an Incidental Harassment Authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the Alaska Department of Transportation and Public Facilities (ADOT&PF) to incidentally harass, by Level A and Level B harassment, marine mammals during pile driving activities associated with the Auke Bay Ferry Terminal Modifications and Improvements Project in Juneau, Alaska.

DATES: This Authorization is effective from January 1, 2020 through December 31, 2019.

FOR FURTHER INFORMATION CONTACT: Amy Fowler, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at:

<https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

Summary of Request

On January 17, 2019, NMFS received a request from ADOT&PF for an IHA to take marine mammals incidental to pile driving activities at the Auke Bay Ferry Terminal in Juneau, Alaska. The application was deemed adequate and complete on April 1, 2019. ADOT&PF’s request was for take of a small number of seven species of marine mammals by Level B

harassment and Level A harassment. Neither ADOT&PF nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Specified Activity

ADOT&PF is planning to modify and improve the existing dolphin structures at the Auke Bay Ferry Terminal. There are currently three Alaska Marine Highway System ferry berths in Auke Bay. The planned project will involve the East Stern Berth facility, which was originally constructed in 2003 to accommodate new fast vehicle ferries. The East Stern Berth must be renovated to accommodate two new Alaska-class ferries, which will enter service in spring 2020. Four existing dolphins at the ferry terminal will be removed using a vibratory driver, and three breasting dolphins and two mooring dolphins will be installed using both vibratory and impact hammers. Vibratory pile removal and installation and impact pile installation would introduce underwater sounds at levels that may result in take, by Level A and Level B harassment, of marine mammals in Auke Bay.

During the 30-day public comment period, ADOT&PF notified NMFS that based on experiences docking the *M/V Tazlina* at the Auke Bay Ferry Terminal, ADOT&PF engineers had developed an updated design concept that would result in a decrease in the number and size of piles to be installed and removed, and therefore a decrease in the estimated number of days of activity. Differences between the activities described in the **Federal Register** notice of proposed IHA (84 FR 22453; May 17, 2019) and the updated project plans are described here.

Dates and Duration

In the original project plan, construction was scheduled to begin in November 2019 and continue through April 2020. Construction is now scheduled to occur over a two-month period between January and June 2020. Pile driving will be intermittent during this period, depending

on weather, construction and mechanical delays, and logistical constraints. Pile installation and removal can occur at variable rates, from a few minutes to several hours per day. Vibratory pile installation and removal was previously estimated to occur over 27 non-consecutive days within the 6-month construction window, and impact installation was estimated to occur intermittently on 12 of those 27 days. With the updated project design, vibratory pile installation and removal is expected to occur on 14 non-consecutive days within the construction window, and impact installation is expected to occur intermittently on 10 of those 14 days.

Specific Geographic Region

The project occurs in Auke Bay, north of Juneau, Alaska. A detailed description of the area is provided in the **Federal Register** notice of proposed IHA (84 FR 22453; May 17, 2019) and is not repeated here. Please see that **Federal Register** notice for more information.

Detailed Description of Specific Activity

The original project design included the removal and replacement of four existing 5-pile dolphins and a single 1-pile dolphin with three 4-pile dolphins and two 3-pile dolphins. A total of 21 steel pipe piles were to be removed and 18 steel pipe piles were to be installed (Table 1). The updated design removes one existing 5-pile dolphin and installing three new 5-pile dolphins. A total of 15 steel pipe piles will be installed and 5 piles will be removed. Table 1 provides a comparison between the piles and duration of the original and updated designs.

Table 1. Number of Piles and Duration of Activity by Pile Type.

Pile Size	Number of Piles		Days of Installation/ Removal	
	Original Design	Updated Design	Original Design	Updated Design
<i>Install</i>				
30-in steel piles	12	6	8	4

24-in steel piles	6	9	4	6
<i>Remove</i>				
30-in steel piles	1	0	1	0
24-in steel piles	12	3	8	2
20-in steel piles	8	2	6	2
Total	39	20	27	14
<i>Total Install</i>	<i>18</i>	<i>15</i>	<i>12</i>	<i>10</i>
<i>Total Remove</i>	<i>21</i>	<i>5</i>	<i>15</i>	<i>4</i>

Piles range in size from 20 to 30-inch (in) diameter. Piles will be installed vertically (plumb) and/or installed at an angle (battered). Piles will be advanced to refusal using a vibratory hammer and the final approximately 10 ft will be driven using an impact hammer so that the structural capacity of the pile embedment can be verified. The pile installation methods used will depend on sediment depth and conditions at each pile location. ADOT&PF estimates that one to three piles could be installed per day. To account for inefficiencies and delays, ADOT&PF estimated a mean installation and removal rate of 1.5 piles per day. While the number of piles to be installed and removed and the number of days of activity have changes, the duration per pile of vibratory installation and removal and the anticipated number of strikes per pile have remained the same as those presented in the **Federal Register** notice of proposed IHA (84 FR 22453; May 17, 2019). Specifically, vibratory installation of both 24- and 30-in piles is expected to take 45 minutes per pile, while vibratory removal of 20-, 24-, and 30-in piles is expected to take 30 minutes per pile. Each pile installed is expected to require 400 strikes from an impact hammer.

In addition to the pile size and number changes described above, ADOT&PF now plans to use a drilled soil anchor to secure 12 of the piles to the glacial till layer to withstand uplift forces. Anchors will be installed within some of the pipe piles and drilled into dense glacial till below the elevation of the pile tip after the pile has been driven through the overlying sediment

layer to refusal. An 8-in diameter steel pipe casing is inserted within the larger diameter production piles (24- or 30-in piles) and driven into the glacier till layer. A drill bit attached to a stem rod is then inserted into the steel pipe casing and a 6- to 8-in diameter hole is drilled into the soil with rotary and percussion drilling methods. The drilling work is contained within the steel pipe casing and the steel pipe pile. The typical depth of the drilled hole varies, but an anticipated depth of 30 ft or more is expected to be necessary. After drilling, a steel anchor rod is then grouted into the drilled hole and affixed to the top of the pile.

Underwater noise from soil anchor installation is anticipated to be low considering the double encasement surrounding the drill rod and the depth of the overlying sediments. The glacial till layer is overlain with 35 to 75 ft of sediments, and is expected to attenuate noise production from drilling and reduce noise propagation into the water column. Additionally, the casing used during drilling is inside the larger diameter pile, further reducing noise levels. The pile that the casing and drill will be lowered into will serve as a cofferdam and prevent drilling noise from propagating through the water column. Noise associated with the soil anchor drilling is anticipated to be contained nearly entirely within the piling and is not expected to reach or exceed the 120 decibel (dB) threshold for continuous noise sources (NMFS 2019). An air impact hammer may be used to install the soil anchor. These additional strikes are conservatively accounted for in the total estimated strikes per pile (400) for the outer production piles. Due to the low noise levels associated with the soil anchor drilling, drilling is not expected to result in harassment and is not discussed further.

Above-water work associated with the project will consist of the installation of two shore anchor struts above the high tide line. Additionally, there will be some improvement and retrofitting to the dock-attached stern fenders. Existing utilities, including electrical and sewer,

will be replaced and improved. No in-water noise is anticipated in association with above-water and upland construction activities. Airborne sound is only expected to impact pinnipeds that are hauled out in the area where sound levels exceed in-air harassment thresholds. No pinniped haulouts exist in the project area and no harassment from airborne sound is expected to result from project activities. Therefore, above-water construction will not be discussed further in this document.

Comments and Responses

A notice of NMFS's proposal to issue an IHA to ADOT&PF was published in the **Federal Register** on May 17, 2019 (84 FR 22453). That notice described, in detail, ADOT&PF's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received comments from the Marine Mammal Commission. The Marine Mammal Commission recommended that NMFS issue the IHA, subject to inclusion of the proposed mitigation, monitoring, and reporting measures.

Comment 1: The Commission noted that the source levels used for impact installation of 24- and 30-in piles were nearly identical. The Commission stated that while the source level ranges for 24- and 30-in piles overlap, the use of the same source level for different-sized piles is an artifact of choosing one-off source measurements of only a single or a few piles. Source levels associated with impact installation of steel pipe piles should exhibit increasing trends with increasing diameter of the piles. The Commission recommended that NMFS conduct internal reviews of compiled source level data and make the compilation(s) available to all relevant action proponents for use in the near term.

Response: NMFS agrees that the range of source level values overlaps for these pile sizes. In this case, sound source verification for impact installation of 30-in piles at the exact project site was used to provide the source levels for installation of 30-in piles (Denes *et al.*, 2016). Absent site-specific source levels for 24-in piles, NMFS used the source levels reported in the California Department of Transportation (Caltrans) pile driving source level compendium (Caltrans 2015). Additionally, the Caltrans compendium reports equal root mean square (rms) and single-strike sound exposure level (SEL_{ss}) for 24- and 30-in piles. NMFS is currently compiling source level reports from various sources to create a comprehensive pile driving source level compendium and will make that document available once it has been finalized.

Comment 2: The Commission recommended that NMFS refrain from using the proposed renewal process for ADOT&PF's authorization. The renewal process should be used sparingly and selectively, by limiting its use only to those proposed incidental harassment authorizations that are expected to have the lowest levels of impacts on marine mammals and that require the least complex analyses. If NMFS elects to use the renewal process frequently or for authorizations that require a more complex review or for which much new information has been generated the Commission recommended that NMFS provide the Commission and other reviewers the full 30- day comment period as set forth in section 101(a)(5)(D)(iii) of the MMPA.

Response: We appreciate the Commission's input and direct the reader to our recent response to a similar comment, which can be found at 84 FR 52464 (October 2, 2019), pg. 52466. We will consider the Commission's comment further when and if ADOT & PF requests a Renewal IHA.

Changes from the Proposed IHA to Final IHA

As described above, the design of the project has changed since publication of the **Federal Register** notice of proposed IHA (84 FR 22453; May 17, 2019), such that fewer piles will be removed and installed over fewer days. In addition to the changes to the project design, NMFS has revised the estimated proportion of Western Distinct Population Segment (DPS) Steller sea lions from 2 percent to 18.1 percent, based on information presented in Hastings *et al.* (2019). As a result, NMFS has authorized more takes of wDPS Steller sea lions and fewer takes of Eastern DPS Steller sea lions than what was proposed. This change is described further in the “Estimated Take” section.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS’s Stock Assessment Reports (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS’s website (<https://www.fisheries.noaa.gov/find-species>).

Table 2 lists all species with expected potential for occurrence in Auke Bay and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2016). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS’s SARs). While no mortality is anticipated or authorized here, PBR and annual serious

injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Alaska and U.S. Pacific SARs. All values presented in Table 2 are the most recent available at the time of publication and are available in the 2017 SARs (Muto *et al.*, 2018; Caretta *et al.*, 2018) and draft 2018 SARs (available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports>).

Table 2. Marine Mammals That Could Occur in the Project Area.

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Eschrichtiidae						
<i>Gray whale</i>	<i>Eschrichtius robustus</i>	Eastern North Pacific	-/-; N	26,960 (0.05, 25,849, 2016)	801	138
Family Balaenopteridae (rorquals)						
Humpback whale	<i>Megaptera novaeangliae</i>	Central North Pacific	-/-; Y	10,103 (0.3, 7,890, 2006)	83	25
Minke whale	<i>Balaenoptera acutorostrada</i>	Alaska	-/-; N	N/A (see SAR, N/A,	UND	0

				see SAR)		
<i>Fin whale</i>	<i>Balaenoptera physalus</i>	Northeast Pacific	E/D; Y	see SAR (see SAR, see SAR, 2013)	5.1	0.6
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	<i>Orcinus orca</i>	Alaska Resident	-/-; N	2,347 (N/A, 2347, 2012)	24	1
Killer whale	<i>Orcinus orca</i>	Northern Resident	-/-; N	261 (N/A, 261, 2011)	1.96	0
Killer whale	<i>Orcinus orca</i>	West Coast Transient	-/-; N	243 (N/A, 243, 2009)	2.4	0
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena</i>	Southeast Alaska	-/-; Y	975 (0.10; 896; 2012)	8.9	34
Dall's porpoise	<i>Phocoenoides dalli</i>	Alaska	-/-; N	83,400 (0.097, N/A, 1991)	UND	38
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	<i>Eumetopias jubatus</i>	Eastern DPS	E/D; Y	54,267 (see SAR, 54,267, 2017)	326	252
Steller sea lion	<i>Eumetopias jubatus</i>	Western DPS	-/-; N	41,638 (see SAR, 41,638, 2015)	2,498	108
Family Phocidae (earless seals)						
Harbor seal	<i>Phoca vitulina</i>	Lynn Canal/Stephens Passage	-/-; N	9,478 (see SAR, 8,605, 2011)	155	50

1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2 - NMFS marine mammal stock assessment reports online at: www.nmfs.noaa.gov/pr/sars/. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable.

3 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

NOTE - Italicized species are not expected to be taken and are not included in this authorization

All species that could potentially occur in the project area are included in Table 2.

However, the spatial and temporal occurrence of gray whales and fin whales in the area is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Sightings of gray whales and fin whales are uncommon in the inland waters of southeast Alaska. These species are typically seen closer to the open waters of the Gulf of Alaska. Additionally, the timing of the project (November through April) coincides with the period when these species are expected to be further south in their respective breeding areas. Take of gray whales and fin whales was not requested and has not been authorized, and these species are not considered further in this document.

A detailed description of the of the species likely to be affected by the Auke Bay Ferry Terminal Modifications and Improvements project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the Federal Register notice for the proposed IHA (84 FR 22453; May 17, 2019); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that Federal Register notice for these descriptions. Please also refer to NMFS' website (<https://www.fisheries.noaa.gov/find-species>) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from ADOT&PF's activities have the potential to result in behavioral harassment of marine mammals in the vicinity of the action area. The **Federal Register** notice for the proposed IHA (84 FR 22453; May 17, 2019) included a discussion of the

effects of anthropogenic noise on marine mammals, therefore that information is not repeated here; please refer to that **Federal Register** notice (84 FR 22453; May 17, 2019) for that information.

Marine Mammal Habitat Effects

The main impact associated with ADOT&PF's activities would be temporarily elevated sound levels and the associated direct effects on marine mammals. The project would not result in permanent impacts to habitats used directly by marine mammals, such as haulout sites, but may have potential short-term impacts to food sources such as forage fish, and minor impacts to the immediate substrate during installation and removal of piles during the pile driving project. These potential effects are discussed in detail in the **Federal Register** notice for the proposed IHA (84 FR 22453; May 17, 2019), therefore that information is not repeated here; please refer to that **Federal Register** notice for that information.

Estimated Take

This section provides an estimate of the number of incidental takes authorized through this IHA, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment, as use of the vibratory and impact pile hammers has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for high frequency species and phocids because predicted auditory injury zones are larger than for other hearing groups. Auditory injury is unlikely to occur for other groups. The required mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable.

As described previously, no mortality is anticipated or authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (e.g., previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the authorized take.

Acoustic Thresholds

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 microPascal (μPa) (root mean square (rms)) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources.

ADOT&PF's planned activity includes the use of continuous (vibratory pile driving and removal) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment for non-explosive sources - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). ADOT&PF's planned activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving and removal) sources.

These thresholds are provided in Table 3. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Table 3. Thresholds Identifying the Onset of Permanent Threshold Shift.

Hearing Group	PTS Onset Acoustic Thresholds* (Received Level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	<i>Cell 1</i> $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	<i>Cell 2</i> $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	<i>Cell 3</i> $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	<i>Cell 4</i> $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	<i>Cell 5</i> $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	<i>Cell 6</i> $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	<i>Cell 7</i> $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	<i>Cell 8</i> $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	<i>Cell 9</i> $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	<i>Cell 10</i> $L_{E,OW,24h}$: 219 dB
<p>* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.</p> <p><u>Note:</u> Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1 μPa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (i.e., varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.</p>		

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the planned project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile driving and removal). The maximum (underwater) area ensonified above the thresholds for behavioral harassment referenced above is 22.5 km² (8.69 mi²), and is governed by the topography of Auke Bay and the various islands located within and around the bay. The eastern part of Auke Bay is acoustically shadowed by Auke Cape, while Portland Island, Coghlan Island, Suedla Island, and Spuhn Island would inhibit sound transmission from reaching the more open waters toward Mansfield Peninsula (see Figure 6-2 in the IHA application). Additionally, vessel traffic and other commercial and industrial activities in the project area may contribute to elevated background noise levels which may mask sounds produced by the project.

The project includes vibratory and impact pile installation of steel pipe piles and vibratory removal of steel pipe piles. Source levels of pile installation and removal activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature, including past pile driving activities in Auke Bay. Source levels for each pile size and driving method are presented in Table 4. The source level for vibratory installation of 24-inch piles and vibratory removal of 24-inch and 20-inch piles are from measurements of 24-inch steel piles driven at Navy installations in Puget Sound, Washington (United States Navy 2015). As there are no measurements of source levels for these pile types in Alaska, we use the Navy's source levels as a proxy. The vibratory and impact source levels for 30-inch pile

installation is from pile driving activities at the Auke Bay ferry terminal in November 2015 (Denes *et al.*, 2016). The source level for impact installation of 24-inch piles is based on the averaged source level of the same type of pile reported by California Department of Transportation (Caltrans) in a pile driving source level compendium document (Caltrans 2015). Source levels for vibratory installation and removal of piles of the same diameter are assumed to be the same.

Table 4. Sound Source Levels for Pile Sizes and Driving Methods.

Pile size	Method	Source level			Literature source
		dB RMS	dB SEL ^a	dB peak	
20-inch	vibratory	161 ^b	N/A	N/A	Navy 2015
24-inch	vibratory	161	N/A	N/A	Navy 2015
24-inch	impact	190	177	203	Caltrans 2015
30-inch	vibratory	168	N/A	N/A	Denes <i>et al.</i> 2016
30-inch	impact	191	177	206	Denes <i>et al.</i> 2016

^a Sound exposure level (dB re 1 $\mu\text{Pa}^2\text{-sec}$)

^b Source level data for 20-in piles are not available. Source levels for 20-in piles are conservatively assumed the be the same as 24-in piles

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \text{Log}_{10} (R_1/R_2), \text{ where}$$

TL = transmission loss in dB

B = transmission loss coefficient

R_1 = the distance of the modeled SPL from the driven pile, and

R_2 = the distance from the driven pile of the initial measurement

Absent site-specific acoustical monitoring with differing measured transmission loss, a practical spreading value of 15 is used as the transmission loss coefficient in the above formula. For vibratory and impact pile driving of 30-inch piles at the Auke Bay ferry terminal, Denes *et al.*, (2016) measured transmission loss that differed slightly from the standard practical value of 15. The transmission loss coefficient for vibratory driving of 30-inch piles was determined to be 16.4 while the coefficient for impact driving of 30-inch piles was determined to be 14.6. These transmission loss coefficients were used to calculate the Level A and Level B harassment zones for 30-inch piles. Site-specific transmission loss data for 20- and 24-inch piles are not available, therefore the default coefficient of 15 is used for these pile sizes to determine the distances to the Level A and Level B harassment thresholds.

Table 5. Pile Driving Source Levels and Distances to Level B Harassment Thresholds.

Pile Size and Method	Source Level at 10 m (dB re 1 μPa rms)	Level B Threshold (dB re 1 μPa rms)	Propagation (xLogR)	Distance to Level B Threshold (m)	Level B Harassment Ensonified Area (km²)
20-inch vibratory	161	120	15	5,412	15.3
24-inch vibratory	161	120	15	5,412	15.3
24-inch impact	190	160	15	1,000	1.5
30-inch vibratory	168	120	16.4	8,449	22.5
30-inch impact	191	160	14.6	1,328	2.3

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in

the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources (such as pile drivers), NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would not incur PTS. Inputs used in the User Spreadsheet (Table 6), and the resulting isopleths are reported below (Table 7).

Table 6. User Spreadsheet Input Parameters Used for Calculating Level A Harassment Isopleths.

File Size and Installation Method	Spreadsheet Tab Used	Weighting Factor Adjustment (kHz)	Source Level at 10 m	Propagation (xLogR)	Number of Strikes Per Pile	Number of Piles Per Day	Duration to per Pile (minutes)
20-inch and 24-inch Vibratory Removal	A.1) Vibratory pile driving	2.5	161 dB rms	15LogR		3	30
30-inch Vibratory Removal	A.1) Vibratory pile driving	2.5	168 dB rms	16.4LogR		3	30
24-inch Vibratory Installation	A.1) Vibratory pile driving	2.5	161 dB rms	15LogR		3	45
30-inch Vibratory Installation	A.1) Vibratory pile driving	2.5	168 dB rms	16.4LogR		3	45
24-inch Impact Installation	E.1) Impact pile driving	2	177 dB SEL	15LogR	400	1 – 3 ^a	
30-inch Impact	E.1) Impact pile driving	2	177 dB	14.6LogR	400	1 – 3 ^a	

Installation			SEL				
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^a To account for potential variations in daily productivity during impact installation, isopleths were calculated for different numbers of piles that could be installed per day (Table 1).

Table 7. Calculated Distances to Level A Harassment Isopleths.

Activity	Level A Harassment Zone (m)				
	LF-Cetaceans	MF-Cetaceans	HF-Cetaceans	Phocids	Otariids
20-inch and 24-inch Vibratory Removal	9	1	14	6	1
30-inch Vibratory Removal	25	3	25	16	2
24-inch Vibratory Installation	12	1	18	8	1
30-inch Vibratory Installation	31	4	45	20	2
24-inch Impact Installation (3 piles per day)	449	16	535	241	18
24-inch Impact Installation (2 piles per day)	343	13	409	184	14
24-inch Impact Installation (1 pile per day)	216	8	258	116	9
30-inch Impact Installation (3 piles per day)	499	17	597	263	18
30-inch Impact Installation (2 piles per day)	378	13	452	199	14
30-inch Impact Installation (1 pile per day)	235	8	281	124	9

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals and describe how it is brought together with the information above to produce a quantitative take estimate. When available, peer-reviewed scientific publications were used to estimate marine mammal abundance in the project area. However, scientific surveys and resulting data such as population estimates, densities, and other quantitative information are lacking for most marine mammal populations and most areas of southeast Alaska, including Auke Bay. Therefore, AKDOT&PF gathered qualitative information from discussions with knowledgeable local people in the Auke Bay area, including biologists, the harbormaster, a tour operator, and other individuals familiar with marine mammals in the Auke Bay area.

Here we describe how the information provided above is brought together to produce a quantitative take estimate. Because reliable densities are not available, the applicant requests take based on the maximum number of animals that may occur in the harbor per day multiplied by the number of days of the activity.

Steller Sea Lion

Steller sea lions are common within Auke Bay but generally only occur in the area during winter. Most individuals that frequent Auke Bay haul out at Benjamin Island in Lynn Canal. The Auke Bay boating community observes Steller sea lions transiting between Auke Bay and Benjamin Island regularly during winter. Steller sea lions are not known to haul out on any beaches or structures within Auke Bay, but animals have been observed foraging within Auke Bay, and may rest in large raft groups in the water. Groups as large as 121 individuals have been observed in Auke Bay (Ridgway pers. observ.).

ADOT&PF estimates that one large group (121 individuals) may be exposed to project-related underwater noise daily on 14 days of pile installation and removal activities, for a total of 1,694 exposures. In the **Federal Register** notice of proposed IHA (84 FR 22453; May 17, 2019), NMFS assumed only two percent of Steller sea lions present in Auke Bay were expected to belong to the wDPS. However, new research on the numbers of wDPS Steller sea lions in southeast Alaska suggests that up to 18.1 percent of Steller sea lions in the project vicinity may be from the wDPS (Hastings *et al.*, 2019). Therefore, NMFS has assigned 18.1 percent of the calculated exposures to the wDPS, for a total of 307 exposures of wDPS Steller sea lions and 1,387 exposures of eDPS Steller sea lions.

The largest Level A harassment zone for otariid pinnipeds extends 18 m from the source (Table 6). ADOT&PF is planning to implement a minimum 20 m shutdown zone during all pile installation and removal activities (see *Mitigation* section), which is expected to eliminate the potential for Level A take of Steller sea lions. Therefore, no takes of Steller sea lions by Level A harassment were requested or authorized.

Harbor Seal

Harbor seals are commonly sighted in the waters of the inside passages throughout southeast Alaska. Seals occur year-round within the project area and are regularly sighted in Auke Bay, including Statter Harbor. NOAA aerial survey data indicate that groups ranging from 10 to 52 seals could be present within the project area during summer at haulouts on the western side of Coghlan Island, as well as on Battleship Island (Ridgway unpubl. data).

Harbor seals are known to haul out within the Level B harassment zones and may be exposed to noise levels in excess of the Level B harassment thresholds upon entering the water.

ADOT&PF estimates up to 52 harbor seals could be exposed to elevated sound levels on each day of pile driving, for a total of 728 exposures.

The largest Level A harassment zone for phocid pinnipeds results from impact pile driving of 30-inch piles and extends 263 m from the source (Table 6). There are no haulouts located within the Level A harassment zone and although it is unlikely that harbor seals will enter this area without detection while pile driving activities are underway, it is possible that harbor seals may approach and enter the Level A harassment zone undetected. ADOT&PF estimated that up to 11 harbor seals may approach the site within 263 m of the source each day. Impact pile driving may occur on up to 10 days. For this reason, ADOT&PF has requested Level A take of 11 harbor seals daily on the 10 days of impact pile driving for a total of 110 takes by Level A harassment. The largest Level A harassment zone for phocid pinnipeds from vibratory pile driving extends 20 m from the source (Table 6). ADOT&PF is planning to implement a minimum 20 m shutdown zone during all pile installation and removal activities (see *Mitigation* section), which is expected to eliminate the potential for Level A harassment of harbor seals from vibratory pile driving.

Harbor Porpoise

Although there have been no systematic studies or observations of harbor porpoises specific to Auke Bay, there is the potential for them to occur within the project area. Abundance data for harbor porpoises in southeast Alaska were collected during 18 seasonal surveys spanning 22 years, from 1991 to 2012. During that study, a total of 398 harbor porpoises were observed in the northern inland waters of southeast Alaska, including Lynn Canal (Dahlheim *et al.*, 2015). Mean group size of harbor porpoises in southeast Alaska varies by season. In the fall, mean group size was determined to be 1.88 harbor porpoises (Dahlheim *et al.*, 2009).

ADOT&PF has conservatively assumed that one pair of harbor porpoises may be present in Auke Bay per day.

One pair of harbor porpoises per day could enter the Level B harassment zone for a total of 28 exposures. The largest Level A harassment zone results from impact driving of 30-inch piles, and extends 597 m from the source (Table 6). Impact pile driving may occur on up to 10 days (Table 1). ADOT&PF will implement a shutdown zone for harbor porpoises that encompasses the largest Level A harassment zone (see *Mitigation* section). However, harbor porpoises are known to be an inconspicuous species and are challenging for protected species observers (PSOs) to sight, making any approach to a specific area potentially difficult to detect. Because harbor porpoises move quickly and elusively, it is possible that they may enter the Level A harassment zone without detection. ADOT&PF has estimated that one pair of harbor porpoises may enter the Level A harassment zone every other day over the 10 days of impact pile driving, which is used to conservatively predict a total of 10 exposures to Level A harassment. The largest Level A harassment zone for high-frequency cetaceans from vibratory pile driving is 45 m. ADOT&PF is planning to implement a minimum 50 m shutdown zone for all cetacean species during vibratory pile installation and removal activities (see *Mitigation* section), which is expected to eliminate the potential for Level A harassment of harbor porpoises from vibratory pile driving.

Dall's Porpoise

Dall's porpoises are not expected to occur within Auke Bay because the shallow water habitat of the bay is atypical of areas where Dall's porpoises usually occur. However, Dall's porpoises may opportunistically inhabit nearshore habitat, especially in spring. Therefore, ADOT&PF estimated that one large pod of Dall's porpoise (15 individuals) may occur within the

Level B harassment zone once per month in the months of March and April, for a total of 30 takes by Level B harassment.

ADOT&PF will implement shutdown zones for porpoises that encompass the largest Level A harassment zones for each pile driving activity (see *Mitigation* section). The largest Level A harassment zone for Dall's porpoise extends 597 m from the source during impact installation of 30-inch piles (Table 6). Given the larger group size and more conspicuous rooster-tail generated by swimming Dall's porpoises, which makes them more noticeable than harbor porpoises, PSOs are expected to detect Dall's porpoises prior to them entering the Level A harassment zone. Therefore, takes of Dall's porpoises by Level A harassment have not been authorized.

Killer Whale

Killer whales are observed occasionally during summer throughout Lynn Canal but their presence in Auke Bay is unlikely. As a precaution, because Level B harassment zones extend beyond the more enclosed waters of Auke Bay, AKDOT&PF has estimated that one pod of killer whales (15 individuals) may enter the Level B harassment zone once over the course of the project for a total of 15 takes by Level B harassment.

ADOT&PF will implement shutdown zones that encompass the largest Level A harassment zones for killer whales during all pile driving activities. Killer whales are generally conspicuous and PSOs are expected to detect killer whales and implement a shutdown before the animals enter the Level A harassment zone. Therefore, takes by Level A harassment have not been authorized.

Humpback Whale

Use of Auke Bay by humpback whales is intermittent and irregular year-round. During winter, researchers have documented 1 to 19 individual humpback whales per month in waters close to the project area, including Lynn Canal (Moran *et al.*, 2018a; Straley *et al.*, 2018). Group sizes in southeast Alaska generally range from one to four individuals (Dahlheim *et al.*, 2009). Based on observations of humpback whales within Auke Bay during winter, ADOT&PF estimates that one group of up to four individuals may be exposed to project-related underwater sound each day during the 14 days of pile driving activities, for a total of 56 exposures.

The largest Level A harassment zone for humpback whales extends 499 m from the source during impact installation of 30-inch piles (Table 6). Given the irregular and small presence of humpback whales in Auke Bay, along with the fact that PSOs are expected to detect humpback whales before they enter the Level A harassment zone and implement shutdowns to prevent take by Level A harassment, no Level A takes have been authorized.

Minke Whale

Dedicated surveys for cetaceans in southeast Alaska found that minke whales were scattered throughout inland waters from Glacier Bay and Icy Strait to Clarence Strait, with small concentrations near the entrance of Glacier Bay. All sightings were of single minke whales, except for a single sighting of multiple minke whales. Surveys took place in spring, summer, and fall, and minke whales were present in low numbers in all seasons and years (Dahlheim *et al.*, 2009). Anecdotal reports have not included minke whales near Auke Bay. However, minke whales are distributed throughout a wide variety of habitats and have been observed in nearby Glacier Bay, indicating they may potentially occur within the Level B harassment zone. Therefore, ADOT&PF estimates that one minke whale per month may enter the Level B

harassment zone over the course of pile driving activities, for a total of six takes by Level B harassment.

The Level A harassment zones for minke whales are the same as for humpback whales, and the shutdown protocols will be the same as well. Therefore, given the low occurrence of minke whales combined with the mitigation, takes by Level A harassment have not been authorized.

Table 8. Authorized Take by Level A and Level B Harassment, by Species and Stock.

Common name	Stock	Stock abundance ^a	Level A	Level B	Total authorized take	Authorized take as percentage of stock
Humpback whale	Central North Pacific	10,103	0	56 ^b	56	0.55
Minke Whale	Alaska	N/A	0	6	6	N/A
Killer whale	Alaska Resident	2,347	0	15	15	0.64 ^d
	Northern Resident	261				5.75 ^d
	West Coast Transient	243				6.17 ^d
Harbor porpoise	Southeast Alaska	975	10	18	28	2.87
Dall's porpoise	Alaska	83,400	0	30	30	< 0.1
Steller sea lion	Western U.S.	54,267	0	307	307 ^c	0.57
	Eastern U.S.	41,638	0	1,387	1,387	3.33
Harbor seal	Lynn Canal/ Stephens Passage	9,478	110	618	728	7.68

^a Stock or DPS size is N_{best} according to NMFS 2018 Draft Stock Assessment Reports.

^b For ESA section 7 consultation purposes, 6.1 percent are designated to the Mexico DPS and the remaining are designated to the Hawaii DPS; therefore, we assigned 4 Level B takes to the Mexico DPS.

^c Based on the percent of branded animals at Gran Point and in consultation with the Alaska Regional Office, we used an 18.1 percent distinction factor to determine the number of animals potentially from the western DPS.

^d These percentages assume all 15 takes may occur to each individual stock, thus the percentage of one or more stocks are likely inflated as the takes would be divided among multiple stocks.

Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) the manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned); and

(2) the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Mitigation for Marine Mammals and their Habitat

In addition to the measures described later in this section, ADOT&PF must employ the following standard mitigation measures:

- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity, and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For in-water heavy machinery work other than pile driving (*e.g.*, standard barges, etc.), if a marine mammal comes within 10 m, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions. This type of work could include the following activities: (1) movement of the barge to the pile location; or (2) positioning of the pile on the substrate via a crane (*i.e.*, stabbing the pile);
- Work may only occur during daylight hours, when visual monitoring of marine mammals can be conducted;
- For those marine mammals for which Level B harassment take has not been requested, in-water pile installation/removal must shut down immediately if such species are observed within or on a path towards the monitoring zone (*i.e.*, Level B harassment zone); and
- If take reaches the authorized limit for an authorized species, pile installation/removal must be stopped as these species approach the Level B harassment zone to avoid additional take.

The following measures also apply to ADOT&PF's mitigation requirements:

Establishment of Shutdown Zone for Level A Harassment - For all pile installation and removal activities, ADOT&PF must establish a shutdown zone. The purpose of a shutdown zone is generally to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). These shutdown zones must be used to prevent incidental Level A exposures from impact pile driving for Steller sea lions, Dall's porpoises, killer whales, humpback whales, and minke whales, and to reduce the potential for such take for harbor seals and harbor porpoises. During all pile driving and removal activities, a minimum shutdown zone of 20 m must be enforced (Table 9). During vibratory pile driving and removal activities, ADOT&PF must enforce a 50 m shutdown zone for all cetacean species (Table 9). Shutdown zones for impact pile driving activities are based on the Level A harassment zones and therefore vary by pile size, number of piles installed per day, and marine mammal hearing group (Table 9). Shutdown zones for impact pile driving must be established each day for the greatest number of piles that are expected to be installed that day. If no marine mammals enter their respective Level A harassment zones during impact installation of the first pile of the day, the shutdown zone for the next pile that same day will be smaller (*e.g.*, the shutdown zone for a three-pile day will be reduced in size to the shutdown zone for a two-pile day for the second pile). Shutdown zones will be further reduced to those for a one-pile day for the third pile of the day, as long as no marine mammals have been exposed to noise levels exceeding the Level A harassment thresholds that day. The placement of Protected Species Observers (PSOs) during all pile driving activities (described in detail in the *Monitoring and Reporting Section*) must ensure shutdown zones are visible.

Table 9. Shutdown Zones During Pile Installation and Removal.

Activity	Piles per day	Shutdown Zone (m)				
		LF cetaceans	MF cetaceans	HF cetaceans	Phocids	Otariids
All vibratory installation and removal	3	50			20	
30-inch pile impact installation	3	500	20	600	270	20
	2	380		460	200	
	1	250		290	130	
24-inch pile impact installation	3	450		550	250	
	2	350		410	200	
	1	220		260	120	

Establishment of Monitoring Zones for Level B Harassment – ADOT&PF must establish monitoring zones to correlate with Level B disturbance zones or zones of influence which are areas where SPLs are equal to or exceed the 160 dB rms threshold for impact driving and the 120 dB rms threshold during vibratory driving. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential cease of activity should the animal enter the shutdown zone. The monitoring zones are presented in Table 10. Placement of PSOs on the shorelines around Auke Bay allow PSOs to observe marine mammals within and near Auke Bay. Should PSOs determine the monitoring zone cannot be effectively observed in its entirety, Level B harassment exposures must be recorded and extrapolated based upon the number of observed take and the percentage of the Level B zone that was not visible.

Table 10. Marine Mammal Monitoring Zones.

Activity	Monitoring zone (m)
20-inch vibratory removal	5,415
24-inch vibratory removal and installation	
24-inch impact installation	1,000
30-inch vibratory	8,450

installation	
30-inch impact installation	1,330

Soft Start - The use of soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors are required to provide an initial set of strikes from the hammer at reduced energy, with each strike followed by a 30-second waiting period. This procedure must be conducted a total of three times before impact pile driving begins. Soft start must be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of thirty minutes or longer. Soft start is not required during vibratory pile driving and removal activities.

Pre-Activity Monitoring - Prior to the start of daily in-water construction activity, or whenever a break in pile installation/removal of 30 minutes or longer occurs, PSOs must observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone must be cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. If the Level B harassment zone has been observed for 30 minutes and non-permitted species are not present within the zone, soft start procedures can commence and work can continue even if visibility becomes impaired within the Level B monitoring zone. When a marine mammal permitted for Level B take is present in the Level B harassment zone, activities may begin and Level B take will be recorded. As stated above, if the entire Level B zone is not visible at the start of construction, pile driving

activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of both the Level B and shutdown zone must commence.

Based on our evaluation of the applicant's proposed measures, NMFS has determined that the required mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the planned action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of:
(1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected

species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

Marine Mammal Visual Monitoring

Monitoring must be conducted by NMFS-approved observers. Trained observers must be placed from the best vantage point(s) practicable to monitor for marine mammals and implement shutdown or delay procedures when applicable through communication with the equipment operator. Observer training must be provided prior to project start, and shall include instruction on species identification (sufficient to distinguish the species in the project area), description and categorization of observed behaviors and interpretation of behaviors that may be construed as being reactions to the specified activity, proper completion of data forms, and other basic components of biological monitoring, including tracking of observed animals or groups of animals such that repeat sound exposures may be attributed to individuals (to the extent possible).

Monitoring must be conducted 30 minutes before, during, and 30 minutes after pile installation/removal activities. In addition, observers must record all incidents of marine

mammal occurrence, regardless of distance from activity, and must document any behavioral reactions in concert with distance from piles being driven or removed. Pile installation/removal activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.

At least two land-based PSOs must be on duty during all pile installation and removal activities. One PSO must be positioned at the ferry terminal to allow full monitoring of the waters within the shutdown zones and the closest waters of the Level B harassment monitoring zones. An additional PSO will be positioned on the shoreline around Auke Bay to observe the larger monitoring zones. Potential PSO locations are shown in Figure 2-2 of ADOT&PF's Marine Mammal Mitigation and Monitoring Plan.

PSOs must scan the waters using binoculars, and/or spotting scopes, and must use a handheld GPS or range-finder device to verify the distance to each sighting from the project site. All PSOs must be trained in marine mammal identification and behaviors and are required to have no other project-related tasks while conducting monitoring. In addition, monitoring must be conducted by qualified observers, placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer operator. ADOT&PF must adhere to the following observer qualifications:

- (i) Independent observers (*i.e.*, not construction personnel) are required;
- (ii) At least one observer must have prior experience working as an observer;
- (iii) Other observers may substitute education (degree in biological science or related field) or training for experience; and
- (iv) ADOT&PF must submit observer CVs for approval by NMFS.

Additional standard observer qualifications include:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

A draft marine mammal monitoring report must be submitted to NMFS within 90 days after the completion of pile installation and removal activities. It must include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;

- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA (if issued), such as an injury, serious injury or mortality, ADOT&PF must immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Alaska Regional Stranding Coordinator. The report must include the following information:

- Description of the incident;
- Environmental conditions (*e.g.*, Beaufort sea state, visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities must not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with ADOT&PF to determine what is necessary to minimize

the likelihood of further prohibited take and ensure MMPA compliance. ADOT&PF would not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that ADOT&PF discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.*, in less than a moderate state of decomposition as described in the next paragraph), ADOT&PF must immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinator. The report must include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with ADOT&PF to determine whether modifications in the activities are appropriate.

In the event that ADOT&PF discovers an injured or dead marine mammal and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), ADOT&PF must report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinator, within 24 hours of the discovery. ADOT&PF must provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the

species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS’s implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Pile installation/removal activities associated with the project as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level A harassment and Level B harassment from underwater sounds generated from pile driving and removal. Potential takes could occur if individuals of these species are present in zones ensonified above the thresholds for Level A or Level B harassment identified above when these activities are underway.

The takes from Level A and Level B harassment would be due to potential behavioral disturbance, TTS, and PTS. No mortality is anticipated given the nature of the activity and measures designed to minimize the possibility of injury to marine mammals. Level A harassment

is only anticipated for harbor porpoise and harbor seal. The potential for harassment is minimized through the construction method and the implementation of the required mitigation measures (see *Mitigation* section).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006; HDR, Inc. 2012; Lerma 2014; ABR 2016). Most likely for pile driving, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted in southeast Alaska, which have taken place with no known long-term adverse consequences from behavioral harassment. Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring. While vibratory driving associated with the planned project may produce sound at distances of many kilometers from the project site, thus intruding on some habitat, the project site itself is located in a busy harbor and the majority of sound fields produced by the specified activities are close to the harbor. Therefore, we expect that animals annoyed by project sound would simply avoid the area and use more-preferred habitats.

In addition to the expected effects resulting from authorized Level B harassment, we anticipate that harbor porpoises and harbor seals may sustain some limited Level A harassment in the form of auditory injury. However, animals in these locations that experience PTS would

likely only receive slight PTS, *i.e.* minor degradation of hearing capabilities within regions of hearing that align most completely with the energy produced by pile driving, *i.e.* the low-frequency region below 2 kHz, not severe hearing impairment or impairment in the regions of greatest hearing sensitivity. If hearing impairment occurs, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics. As described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice through use of soft start.

The project also is not expected to have significant adverse effects on affected marine mammals' habitat. The project activities would not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

Nearly all inland waters of southeast Alaska, including Auke Bay, are included in the southeast Alaska humpback whale feeding BIA (Ferguson *et al.*, 2015), though humpback whale distribution in southeast Alaska varies by season and waterway (Dahlheim *et al.*, 2009). Humpback whales are present within Auke Bay intermittently and in low numbers. The area of the BIA that may be affected by the planned project is small relative to the overall area of the BIA, and the area of suitable humpback whale habitat that is not included in the BIA. The southeast Alaska humpback whale feeding BIA is active between March and November while

the planned project is scheduled to occur between January and June, resulting in only four months of overlap. Additionally, pile driving associated with the project is expected to take only 14 days, further reducing the temporal overlap with the BIA. Therefore, the planned project is not expected to have significant adverse effects on the southeast Alaska humpback whale feeding BIA.

In summary and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality is anticipated or authorized;
- The Level A harassment exposures are anticipated to result only in slight PTS, within the lower frequencies associated with pile driving;
- The anticipated incidents of Level B harassment would consist of, at worst, temporary modifications in behavior that would not result in fitness impacts to individuals;
- The area impacted by the specified activity is very small relative to the overall habitat ranges of all species, does not include ESA-designated critical habitat, and only temporally overlaps with the southeast Alaska humpback whale feeding BIA for four months of the planned six months of activity; and
- The required mitigation measures are expected to reduce the effects of the specified activity to the level of least practicable adverse impact.

In addition, although affected humpback whales and Steller sea lions may be from a DPS that is listed under the ESA, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the stocks' ability to recover. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate

that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and will therefore not result in population-level impacts.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the required monitoring and mitigation measures, NMFS finds that the total marine mammal take from the planned activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Table 7 demonstrates the number of animals that could be exposed to received noise levels that could cause Level A and Level B harassment for the planned work in Auke Bay. Our analysis shows that less than 8 percent of each affected stock could be taken by harassment. The numbers of animals authorized to be taken for these stocks would be considered small relative to the relevant stock's abundances even if each estimated taking occurred to a new individual – an extremely unlikely scenario.

Based on the analysis contained herein of the planned activity (including the required mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes. The planned project is not known to occur in an important subsistence hunting area. It is a developed area with regular marine vessel traffic. However, ADOT&PF plans to provide advanced public notice of construction activities to reduce construction impacts on local residents, ferry travelers, adjacent businesses, and other users of the Auke Bay ferry terminal and nearby areas. This will include notification to local Alaska Native tribes that may have members who hunt marine mammals for subsistence. Of the marine mammals considered in this IHA application, only harbor seals are known to be used for subsistence in the project area. If any tribes express concerns regarding project impacts to subsistence hunting of marine mammals, further communication between will take place, including provision of any project information, and clarification of any mitigation and minimization measures that may reduce potential impacts to marine mammals.

Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the required mitigation and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from ADOT&PF's planned activities.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our action (*i.e.*, the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review.

Endangered Species Act (ESA)

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the Alaska Regional Office, whenever we propose to authorize take for endangered or threatened species.

NMFS Alaska Region issued a Biological Opinion to NMFS Office of Protected Resources on October 3, 2019, which concluded the issuance of an IHA to ADOT&PF is not likely to jeopardize the continued existence of wDPS Steller sea lions or Mexico DPS humpback whales or adversely modify critical habitat because none exists in the area.

Authorization

NMFS has issued an IHA to ADOT&PF for conducting pile installation and removal activities at the Auke Bay ferry terminal between January 1, 2020 and December 31, 2020, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: October 17, 2019.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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